

## CLAIM AMENDMENT(S)

### *Listing of Claims:*

1. (Currently Amended) A tangible machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:  
instantiating a coordinator transaction agent that includes an itinerary and ~~[[a]]~~ an agent state machine, said itinerary indicating a plurality of network elements, said plurality of network elements in communication with said coordinator transaction agent;  
said coordinator transaction agent causing itself to be replicated onto said plurality of network elements according to said itinerary;  
each of said replicated transaction agents causing an indication of their replication to be communicated back to said coordinator transaction agent; and  
said coordinator transaction agent creating a coordinated distributed state machine that coordinates circuit operations with the plurality of network elements by  
~~coordinating operations of~~ to said agent state machine in each of said replicated transaction agents to manage a circuit between the network elements to  
~~implement a distributed state machine.~~
2. (Original) The machine-readable medium of claim 1, wherein said coordinator transaction agent causing itself to be replicated comprises:

said coordinator transaction agent causing communication of a replication of said coordinator transaction agent to a first of said plurality of network elements; said replicated transaction agent in said first network element causing communication of a replication of itself to a second of said plurality of network elements.

3. (Original) The machine-readable medium of claim 1 further comprising:  
a first of said replicated transaction agents autonomously rolling back said state machine based on a criteria.
4. (Original) The machine-readable medium of claim 3 wherein said criteria includes determining a time out period has been consumed.
5. (Original) The machine-readable medium of claim 1 wherein said coordinator transaction agent includes a facility list, said facility list comprising a list of facilities to cross connect within a network element.
6. (Currently Amended) The machine-readable medium of claim 1 wherein said ~~operations~~ manage a circuit includes:  
disabling a first facility and a second facility;  
entering a cross connect for both facilities; and  
enabling said first facility and second facility.

7. (Original) The machine-readable medium of claim 1 wherein said distributed state machine is transitioned in lock step.
8. (Original) The machine-readable medium of claim 1 wherein said distributed state machine is transitioned in turn.
9. (Currently Amended) The machine-readable medium of claim 1, wherein said ~~operation~~ ~~of said distributed state machine~~ manage a circuit causes the formation of a circuit through said plurality of network elements.
10. (Currently Amended) The machine-readable medium of claim 1, wherein said ~~operation~~ ~~of said distributed state machine~~ manage a circuit causes the destruction of a circuit through said plurality of network elements.
11. (Currently Amended) The machine-readable medium of claim 1, wherein said ~~operation~~ ~~of said distributed state machine~~ manage a circuit causes the labeling of a circuit cross connection through said plurality of network elements.
12. (Original) The machine-readable medium of claim 1 further comprising:  
each of said replicated transaction agents autonomously rolling back said state machine  
based on a criteria.

13. (Original) The machine-readable medium of claim 1 wherein said plurality of network elements are switching network elements.
14. (Currently Amended) The machine-readable medium of claim 1, wherein operations of ~~operation of said distributed state machine~~ manage a circuit causes:  
said coordinator transaction agent causing communication of a program to a first of said plurality of network elements;  
said replicated transaction agent in said first network element causing communication of said program to a second of said plurality of network elements.
15. (Original) The machine-readable medium of claim 14 wherein said network element is a computing network element.
16. (Currently Amended) A tangible machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:  
A) instantiating a coordinator transaction agent that includes an itinerary and ~~[[a]]~~ an agent state machine, said itinerary indicating a plurality of network elements onto which said transaction agent is to be replicated, said plurality of network elements in communication with said transaction agent, wherein said coordinator transaction agent creates a coordinated distributed state machine that coordinates circuit operations with the plurality of network elements by coordinating

operations to said agent state machine in each of said replicated transaction agents to manage a circuit between the network elements;

- B) said coordinator transaction agent causing itself to be replicated and transmitted out;
- C) said coordinator transaction agent receiving from each of said replicated transaction agents an indication of their replication;
- D) said coordinator transaction agent transmitting an indication for delivery to each of said replicated transaction agents that instructs them to perform a currently selected step of said agent state machine in their network element;
- E) said coordinator transaction agent receiving from each of said replicated transaction agents an indication of their completion of said currently selected step; and said coordinator transaction agent selecting a next state as said currently selected state of said agent state machine and repeating D and E until a final state of said distributed state machine is reached.

17. (Currently Amended) A tangible machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform a method operations comprising:
- receiving at a network element a replication of a transaction agent that includes an itinerary and [[a]] an agent state machine, said itinerary indicating a plurality of network elements onto which said transaction agent is to be replicated;
- said network elements responsive to said replicated transaction agent, transmitting an indication of said replicated transaction agent's instantiation to a coordinator

transaction agent, said coordinator transaction agent creating a coordinated distributed state machine that coordinates circuit operations with the plurality of network elements by coordinating operations to said agent state machine in each of said replicated transaction agents to manage a circuit between the network elements;

said network element, responsive to said replicated transaction, replicating said replicated transaction agent and transmitting said replication to one of said plurality of network elements;

responsive to receiving state advance communications from said coordinator transaction agent, said replicated transaction agent in said network element causing the performance of the next state of said agent state machine; and

responsive to said replicated transaction agent in said network element detecting successful or unsuccessful completion of the current state in its network element, causing the transmission of an indication to said coordinator network element.

18. (Original) The machine-readable medium of claim 17 wherein said detecting said unsuccessful completion of the current state is caused by the failure of said replicated transaction agent to successfully complete a set of transactions.
19. (Original) The machine-readable medium of claim 18 wherein said replicated transaction agent invokes a roll back of said set of transactions.

20. (Original) The machine-readable medium of claim 17 further comprising said replicated transaction agent invoking transactions to provision a cross connect.
21. (Original) The machine-readable medium of claim 20 further comprising a facility list, said facility list containing a list of facilities to cross connect within said network element.
22. (Original) The machine-readable medium of claim 20 wherein said invoking transactions to provision a cross connect includes:  
disabling the facilities to have said cross connect;  
generating said cross connect for said facilities; and  
enabling said facilities.
23. (Currently Amended) A tangible machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:  
generating a coordinator transaction agent, said coordinator transaction agent includes an itinerary component and [[a]] agent state machine, said itinerary component includes a list of network elements to replicate to;  
replicating a plurality of transaction agents from the coordinator transaction agent to said plurality of network elements as described in said itinerary component;

detecting said plurality of said transaction agents have replicated to said plurality of network elements; and  
instructing said state machines of said plurality of transaction agents to alter state upon executing a set of transactions, wherein the set of transactions create a coordinated distributed state machine that coordinate circuit operations with the plurality of network elements by coordinating operations to said agent state machine in each of said replicated transaction agents to manage a circuit between the network elements.

24. (Original) The machine-readable medium of Claim 23 wherein said set of transactions includes transactions to provision a circuit connection.
25. (Original) The machine-readable medium of Claim 23 wherein said set of transactions includes transactions to install software.
26. (Original) The machine-readable medium of Claim 23 wherein said set of transactions includes transactions to label cross connects.
27. (Original) The machine-readable medium of Claim 23 wherein said set of transactions includes transactions to un-provisioning a circuit connection.



28. (Original) The machine-readable medium of Claim 23 wherein each of said plurality of transaction agents include a facility list, said facility list comprising a list of facilities to cross connect within a network element.
29. (Original) The machine-readable medium of Claim 23 wherein said set of transactions includes transactions to:
- disable a first facility and a second facility;
  - enter a cross connect for both facilities; and
  - enable said first facility and second facility.
30. (Original) The machine-readable medium of Claim 23 wherein said detecting further comprises:
- delivering to said coordinator transaction agent a message from said plurality of transaction agents notifying said coordinator transaction agent that each of said plurality of replicated transaction agents is prepared to execute transactions to generate a circuit connection.
31. (Original) The machine-readable medium of Claim 30 wherein said message is delivered from a last one of said plurality of transaction agents to be replicated.
32. (Original) The machine-readable medium of Claim 23 wherein said plurality of transactions agents execute said set of transactions in lock step.

33. (Original) The machine-readable medium of Claim 23 wherein said plurality of transactions agents execute said set of transactions in turn.
34. (Original) The machine-readable medium of Claim 23 wherein said instructing further comprises:  
delivering a message from said coordinator transaction agent to one of said plurality of transaction agents, said message instructing said state machine to transition state.
35. (Original) The machine-readable medium of Claim 34 wherein said message is delivered to a first of said plurality of transaction agents to be replicated.
36. (Original) The machine-readable medium of Claim 23 wherein said coordinator transaction agent is resident on a EMS.
37. (Original) The machine-readable medium of Claim 23 wherein said coordinator transaction agent and said plurality of transaction agents are a type of mobile agent.
38. (Original) The machine-readable medium of Claim 23 wherein said coordinator transaction agent and said plurality of transaction agents reside in agent environments.

39. (Original) The machine-readable medium of Claim 23 wherein said replicating a plurality of transaction agents includes:  
receiving authentication from said network elements before replicating.
40. (Original) The machine-readable medium of Claim 23 wherein said detecting and instructing, together represents a distributed two-phase commit protocol.
41. (Original) The machine-readable medium of Claim 23 further comprising:  
responding to an unsuccessful state transition with a transaction roll back.
42. (Original) The machine-readable medium of Claim 41 wherein said unsuccessful state transaction is caused by a transaction time-out mechanism.
43. (Currently Amended) A network element comprising:  
a coordinator transaction agent, the coordinator transaction agent including,  
[[a]] an agent state machine to coordinate a distributed sequence of transactions  
across a plurality of network elements;  
an itinerary identifying said plurality of network elements ; and  
said distributed sequence of transactions to be performed on said plurality of network  
elements, said agent state machine including states to replicate said coordinator  
transaction agent to said plurality of network elements and execute said  
distributed sequence of transactions, wherein the set of transactions create a

coordinated distributed state machine that coordinate circuit operations with the plurality of network elements by coordinating operations to said agent state machine in each of said replicated transaction agents to manage a circuit between the network elements.

- 44. (Original) The network management system of claim 43 wherein said sequence of transactions include transactions to provision a circuit.
- 45. (Original) The network management system of claim 43 wherein said sequence of transactions include transactions to install software.
- 46. (Original) The network management system of claim 43 wherein said sequence of transactions includes transactions to label cross connects.
- 47. (Original) The network management system of claim 43 wherein said sequence of transactions includes transactions to un-provision a circuit.
- 48. (Original) The network management system of claim 43 wherein said coordinator transaction agent is resident on a EMS.
- 49. (Original) The network management system of claim 43 further comprising:

a viewer, said viewer requesting said circuit connection to be generated, said viewer receiving a message from said coordinator transaction agent that the circuit connection is complete.

50. (Original) The network management system of claim 43 where said coordinator transaction agent is a type of Java based mobile agent.